

Choline Sulfate Permease: Transfer of Information from Bacteria to Higher Plants?

Abstract. A permease (and sulfatase) for choline sulfate can be induced in plant tissues in the presence of certain bacteria. Induced plant transport requires induction of the corresponding bacterial permease, contact between induced bacteria and plant tissue, and plant protein synthesis. These requirements indicate a transfer of information from bacteria to plants.

This report (1) describes bacteria-mediated transport of choline sulfate by higher plants. The mechanism of interaction between bacteria and plants is not known, but may represent a new type of information transfer.

Choline sulfate has been found in fungi (2), lichens (3), algae (4, 5), and higher plants (5, 6). It is formed by the transfer of sulfate from 3'-phosphoadenosine-5'-phosphosulfate (PAPS) to choline by choline sulfotransferase (7). It is hydrolyzed by choline sulfatase (8, 9), and is believed to function as a reservoir of sulfate. Choline sulfate is transported constitutively by filamentous fungi (10) and higher plants (11, 12) by one or more mechanisms.

In a study of the transport of choline sulfate by excised barley roots, I found that the transport was linear for short periods, but